4 March 1969

MEMORANDUM FOR: Deputy Director for Intelligence

SUBJECT : Weapon System Applications of the Gas Dynamic Laser

1. The "ray gun" of science fiction has recently come into the realm of practical possibility with the development of a new type of laser--the gas dynamic laser, or (inevitably) GDL for short.

2. This device produces a sharply focused beam of infrared radiation with very high continuous power--high enough to do damage at considerable distances. Its name derives from the fact that power to operate it is tapped from a flow of hot gas such as a jet or rocket engine produces. The beam can be aimed by special mirrors. Because of its high power and other characteristics, the GDL can penetrate the atmosphere much better than other types of lasers.

3. We are beginning to include the GDL in our thinking about future advanced weapon programs in the Soviet Union (and perhaps elsewhere too). Several weapon applications are possible. One of particular concern to intelligence is the possibility of a system which would disable reconnaissance satellites or fog their film. At higher power levels, the GDL has an ABM potential. Other uses foreseen include anti-mortar and anti-personnel weapons for the army, and anti-SAM defenses for aircraft.

4. We know the Soviets are working on the theory of GDL's, but beyond that our knowledge is scanty. OSI is mounting an effort to learn what it can about Soviet R&D in this area, and is also monitoring US programs [redacted] 25X1A2g

[redacted] OSR is looking over their shoulders to assess the potential impact of GDL weapon systems on future Soviet military capabilities. 25X1A2g

5. The intelligence problem is a tough one. Facilities for GDL research probably will not be conspicuous. Furthermore, the technicians say that lead time for this kind of weapon system is unusually short. The US effort is less than a year old and already has moved from basic theory to experimental hardware with significant power output.

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